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MANAGERIAL PERCEPTIONS AND  
THE NORMATIVE MODEL OF STRATEGY FORMULATION

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ABSTRACT

The normative model of strategy formulation has long been popular. However, its validity may be questioned. For example, some literature suggests that managers' perceptions of strengths and weaknesses and of their firm's external environment (both important in the normative strategy formulation model) may vary by management level. Differences likely result because of individuals' cognitive schemas, which include their cognitive biases. In turn, systematic errors may occur in managerial decisions. Results from the research reported herein support the notion that managers' perceptions of a firm's strengths and weaknesses and of environmental uncertainty vary by managerial level. Differences in these perceptions were discovered to be more significant within each firm. These results suggest the need to evaluate how the normative approach to strategy formulation is used in firms that solicit inputs from individuals occupying different managerial levels.

## Introduction

From a normative perspective, the formulation of strategy is seen by some (e.g., Hofer and Schendel, 1978; Andrews, 1980; Porter, 1980) to begin with assessments of a firm's internal strengths and weaknesses and its external opportunities and threats. While popular, this is not the only perspective on formulation of strategies. In fact, some (e.g., Mintzberg, 1973, 1978; Bower and Doz, 1979; Quinn, 1980) argue that the normative view may be oversimplified or even inaccurate as a description of strategy formulation processes. Huff (1982) suggests that the influence of a firm's experiences in a particular industry setting may shape strategy formulation processes significantly. As such, the nature of formal strategy formulation processes may be altered substantially. Nonetheless, the normative view continues to influence strongly both the teaching of and research into strategy formulation activities. With respect to teaching, established textbooks (e.g., Newman and Logan, 1981; Christensen, Andrews, Bower, Hammermesh, and Porter, 1982) promote the normative model. In terms of research, several methodologies that can be used to conduct external environmental analyses appear in the literature (e.g., Porter, 1980; Van de Ven and Ferry, 1980). Few studies, however, have examined approaches and techniques used to assess a firm's internal strengths and weaknesses. This lack of research is noteworthy, since identification of strengths and weaknesses is considered to be a critical, initial step in the normative view of strategy formulation processes (Higgins, 1983).

Because of the paucity of research, very little is known about how organizational strengths and weaknesses are actually determined and by whom. In this current study, it is proposed that the assessment process can not be separated from the assessor(s). Evidence is presented supporting the position that actual assessments of strengths and weaknesses will vary substantially among and within different management levels. Stated differently, it is possible that

assessments and the assessment processes are, to some degree, a product of the assessor(s). As such, the accuracy and/or appropriateness of assessments that serve as inputs to a firm's strategy formulation process may be subject to debate. In addition, it suggests that research into strategy formulation processes should be sensitive to the perceiver and how the individual perceptions are factored into the outcome. A similar view was advanced by Pearce (1983) who argued that relative orientations toward examinations of internal and external environmental factors is a product of the individual. This perspective differs somewhat, Pearce (1983) argued, from the traditional one which suggests that persons outside a firm should be appointed as board members to assure a proper orientation to external environmental conditions.

Several objectives were pursued in conducting this study. First, the researchers sought to establish that assessments of a firm's strengths and weaknesses can be expected to vary systematically and substantially among managerial levels. Recent research in cognitive psychology, coupled with established literature in organizational theory, support this expected outcome. A second objective was to subject this expectation to empirical examination. This was accomplished with data collected from separate managerial levels in three different firms. A final objective was to examine how a key environmental component--perceived environmental uncertainty (PEU)--affects these relationships. PEU was included in this design since the concept occupies a central position in several research literatures and evidence suggests that it may affect relationships evaluated in this study. Implications of the results are discussed with regard to strategy formulation processes and for future research efforts.

### Theoretical Review

In this section, relevant research and theory are reviewed and hypotheses established.

#### Strengths and Weaknesses

Only one major systematic study of how organizations define strengths and weaknesses has been completed (Stevenson, 1976). In his research, Stevenson asked fifty managers, from six companies, for their evaluation of corporate strengths and weaknesses and the reasons underlying the evaluations. The sample was structured to yield a relatively broad representation of managers within each firm. From his informal analysis of 191 responses to an open ended research question he concluded that:

The results of the study brought into serious question the value of formal assessment approaches. It was found that an individual's cognitive perceptions of the strengths and weaknesses of his organization were strongly influenced by factors associated with the individual and not only by the organization's attributes. Position in the organization, perceived role, and type of responsibility so strongly influenced the assessment that the objective reality of the situation tended to be overwhelmed. In addition there were wide variations among standards of measurement and criteria for judgment employed. (p. 55)

While potentially interesting, Stevenson's methodology creates some concern regarding the findings' validity. No statistical analyses were conducted to determine the significance of the differences found. Simple percentages of particular responses were tabulated and informal comparisons made. A second concern is that a simple verbal or written response to a question may not be accurate. Decision makers' descriptions of their own policies often are inaccurate (Hoffman, 1960; Slovic, 1969; Balke, Hammond & Meyer, 1973). Similarly, stated policies and intentions often vary from what is actually used. Argyris and Schon (1974) describe this as the difference between "espoused theories" of

action and "theories in use" that actually govern behavior. These researchers suggest that a person's "theory in use" cannot be obtained simply by asking for it. Rather, it must be constructed by observing and recording the person's behavior in the situation under question. Stated differently, what people say in response to the question, "What are your firm's strengths and weaknesses?" may be different from the set of believed strengths and weaknesses they use in making actual strategic decisions.

As noted, Stevenson's (1976) work is the only major study to examine how strengths and weaknesses are assessed in organizations. However, a similar concept (distinctive competencies) has been investigated by Snow and Hrebiniak (1980). This concept was operationalized originally by Selznick (1957), who suggested that a distinctive competence represents those things that an organization does especially well in comparison to its competitors. This definition, or a slight variant, remains an integral component of strategy researchers' (e.g., Schendel and Hofer, 1978; Grant and King, 1982; Hitt and Ireland, 1984) frameworks. In essence, a distinctive competence may be thought of as a subset of a firm's strengths. It is the set of strengths that determine what an organization can perform especially well in comparison to its competitors and that can be manipulated effectively to achieve a competitive advantage.

Snow and Hrebiniak (1980) found that managerial perceptions of distinctive competencies may vary within organizations. These researchers also characterized distinctive competencies within strategic business units in their sample of 88 firms. This was done through analysis of perceptions of managers in their sample. Hitt and Ireland (1984) also relied on upper-level managerial perceptions to examine corporate level distinctive competencies in 185 firms. However, results from both studies are restricted to perceptions from only upper level managers.

### Assessment of the Environment

Although only a few studies have focused on issues relevant to the identification of organizational strengths and weaknesses, assessments of external environmental conditions have been examined more frequently (e.g., Lawrence and Lorsch, 1967). Research focusing on external assessment processes has been categorized by Bourgeois (1980). Results appearing in both the strategic management and organizational theory literatures were included in his analysis. Among the most important of these research efforts are the seminal studies of Lawrence and Lorsch (1967) and Emery and Trist (1965). These researchers found that a firm's actions are affected significantly by individuals' perceptions of degrees of environmental uncertainty. Included within the range of organizational actions affected by perceived environmental uncertainty is the assessment of external environments. In view of this and other evidence recorded in the literature, some (e.g., Duncan, 1972; Downey, Hellriegel and Slocum, 1975; Boulton, Lindsay, Franklin and Rue, 1982; Hitt, Ireland and Palia, 1982) have concluded that PEU is indeed a significant environmental variable. As an indication of this importance, PEU was one of the key environmental variables Bourgeois (1980) suggested should be examined when studying corporate actions. Similarly, Hambrick (1981) noted that both strategy and environment are crucial contingencies for organizations. In fact, these two variables are inextricably interwoven. For example, Lindsay and Rue (1980) and, to a lesser extent, Boulton et al. (1982) found environmental uncertainty to be related to a firm's strategic planning processes. Similarly, Dirsmith and Covalleski (1983) found that the environment exerts a strong influence on a firm's strategic norms. Given this evidence, it may not be surprising that Hrebiniak and Snow (1980) discovered interrelationships between perceptions of environmental uncertainty



and intraorganizational influence. Thus, the degree of PEU may affect strategic planning processes as well as norms and perceptions of internal strengths and weaknesses.

Despite its significance, concerns regarding how PEU is conceptualized and operationalized have surfaced. For example, Downey and Ireland (1979) argued that assessors' perceptions can be measured either quantitatively or qualitatively. Similarly, the assessor can be asked to evaluate either quantitative or qualitative environmental attributes specified by the researcher. All combinations of these variables may be appropriate for use. The challenge is for the researcher to be aware of the outcome sought. In the current study, managers were asked to evaluate quantitative measures of qualitative environmental attributes.

Perceptions of environmental uncertainty may also vary by managerial level. Cox, Hitt and Stanton (1978) found PEU to vary by an administrator's hierarchical level (top, middle or lower). These differences may be accounted for in the context of the jobs at each managerial level and by managers' previous experiences. Each managerial level is assigned unique responsibilities that should be consistent with the scope of both the firm's activities and its relevant external environment. The scope enlarges as one progresses to the top of the managerial hierarchy. In addition, Kiesler and Sproull (1982) note that each manager has distinctive experiences, and that he/she will tend to overgeneralize the extent to which a few similar attributes of a current situation represent an analogue to past experiences. Since managers at each level are more likely to have similar experiences but differences (at least in extent) in experiences between levels, individuals' perceptions of environmental uncertainty may vary. Finally, Thompson (1967) hypothesized that organizations seek to seal off or

buffer their technical cores from environmental influences. This suggests that managers in the technical core (generally lower level managers) may be relatively naive with respect to external environmental conditions.

In summary, the literature suggests that perceived environmental uncertainty influences strategic processes (e.g., determination of strengths and weaknesses) and that these influences may vary by managerial level.

### Cognition and Varying Perceptions

Individuals' basic, cognitive properties result in perceptions of the environment and of internal strengths and weaknesses. These perceptions may vary as a function of managerial level in the organization.

These differences suggest that managers should not be viewed as "faceless abstractions," but as individuals with multiple characteristics (e.g., age, personal history, values and education). These characteristics may vary significantly across managers (Hambrick and Mason, 1984). Given their individuality, managers bring somewhat unique perspectives to processes used to evaluate the organization and its internal and external environments. Few organizational events are approached by a manager as being totally unique and requiring systematic analytical study. Instead, they are processed through preexisting knowledge systems. Known as schemas<sup>1</sup>, (see Norman, 1976, for a discussion of schemas), these systems represent beliefs, theories and propositions that have developed over time based on the manager's personal experiences. At a broader unit of analysis, Huff (1982) implied the possibility that organizations'

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<sup>1</sup>Brief and Downey (1983) discuss the role "implicit theories" play in the structuring of organizations. While differences do exist, a manager's schemas and his/her implicit theories tap similar dimensions of an individual's cognitive makeup.

actions can be characterized as schemas. An organizational schema is primarily a product of managers' interpretations of experiences while operating within certain industries.

Schemas permit managers to categorize an event, assess its consequences, and consider appropriate actions (including doing nothing) and to do so rapidly and often efficiently. Without schemas, a manager, and ultimately the organizations with which he/she is associated, would become paralyzed by the need to analyze "scientifically" an enormous number of ambiguous and uncertain situations. In other words, managers must be able to scan environments selectively so that timely decisions can be made (Hambrick, 1982). The selection of environmental elements to be scanned is likely affected by a manager's schema.

Unfortunately, schemas are not infallible guides to the organization and its environments. In fact, some are relatively inaccurate representations of the world, particularly as conditions change. Furthermore, events often are not labeled accurately and sometimes are processed through inaccurate and/or incomplete knowledge structures.

For the purposes of this research, it is important to understand what managers' schemas actually represent. Kiesler and Sproul (1982) offer the following concise description:

Managers operate on mental representations of the world and those representations are likely to be of historical environments rather than of current ones. (p. 557)

It is this experiential or historical nature that is critical. Simply put, it is likely that perceptions of strengths and weaknesses and the external environment will vary systematically across managerial levels. The variance may be expected since managers' mental representations of conditions probably will be historical in nature and the historical experiences on which they are based

likely have varied across managerial levels. This is not to say that managers at each level share a common overall history, but rather that they often have some significant common historical experiences that vary across levels. As a result, measurable differences in perceptions across levels may be anticipated. For example, managers at each organizational level will tend, on the average, to be near the same age. Age variance across levels will be significantly greater than within levels (Hall, 1976; Veiga, 1981). Being of roughly the same age, cohort managers at each level will tend to have similar life experiences and resultant values and beliefs (stored as schemas). For example, few would argue that people who were draft age during the Second World War and people who were draft age during the Vietnam War tend to have, on the average, values and perspectives about war (stored as schemas) that differ significantly. In other words, different cohorts have different schemas simply as a result of different experience bases that are a product of broad social trends and events. Consider the case of "participative management." Younger professionals (those under 35) are more likely to see the absence of participative management as a weakness of the organization than are older professionals (those over 55) (Business Week, July 2, 1984).

Furthermore, members of each managerial level are likely to be near the same organizational age (i.e., to have been members of the organization or a similar one for about the same period of time). This suggests that they probably have experienced similar histories of organizational events. Stated differently, the organizational history on which various schemas are based will tend to be similar within each managerial level and tend to vary across managerial levels (e.g., at higher levels schemas will be based on a longer historical organizational record).

A second, general reason why perceptions of strengths and weaknesses and

environmental uncertainty are likely to vary as a function of managerial level is the concept of cognitive biases. The psychology of cognitive biases is the study of how people (managers), in making decisions, sometimes make systematic (and often severe) errors (Tversky and Kahneman's [1974] work is an excellent introduction to and survey of this literature). When dealing with uncertain and complex tasks, people (managers) often rely on a limited number of heuristic principles. Doing so simplifies the decision process significantly. In general, these heuristics are useful, but on some occasions they can result in critical errors. Recent evidence suggests that this may occur often in managerial selection decisions (Hitt and Barr, 1984). Reliance on a limited number of heuristics in making strategic decisions could be disastrous.

For the purposes of this research, the most important of these heuristics may be the availability one (see Tversky and Kahneman, 1973 for a thorough discussion). Basically, this heuristic leads people to make decisions by using information that can be brought to the mind easily (i.e., information that is "available"). For example, Tversky and Kahneman (1973) indicate that one may assess the risk of heart attack among middle-aged people by recalling such occurrences among one's acquaintances, even if it can be demonstrated that it is an inappropriate basis for drawing such a conclusion. In the present case, it seems that the information that is "available" will vary by managerial level. In general, this occurs because managers at different levels tend to concentrate on different tasks and hence, deal with different sets of information. For example, a plant inventory manager (typically a lower level managerial position) is likely to have a great deal of information related to inventories available to him. This information would be almost totally obscured at the corporate level. By contrast, top managers are likely to have significant amounts of information regarding cash flow. These data would not be as relevant at lower

managerial levels.

Similarly, there may be some differences in the types of information managers in different organizations seek. These differences may be attributed largely to different industries and the types of information most critical in each industry setting.

Closely related to the concept of availability is the concept of salience. As Kiesler and Sproul (1982) state:

...people attend to and encode salient material--events that are unpleasant, deviant, extreme, intense, unusual, sudden, brightly lit, colorful, alone, or sharply drawn...In sum, salient information has greater weight in the determinance of what is remembered and how well it is organized. (p. 556)

Hence, salience is likely to determine how well remembered and organized (i.e., how "available") information is. What is salient at one level may be totally irrelevant at another. For example, at the lower levels of management, events or information, such as low or high morale of production employees, loss of an account because of quality problems, an unfair dismissal, and a new machining center, are likely to be salient. In contrast, examples of salient events or information at the top management level would include: a sudden drop in stock price, a loss of market share, a change in the bonus plan, and a change in government antitrust policy.

#### Hypotheses

The evidence evaluated herein suggests two hypotheses and one research question.

Hypothesis 1: Perceptions of strength and weakness indicators vary by management level (top, middle, and lower).

Hypothesis 2: Perceptions of environmental uncertainty vary by management level (top, middle, and lower).

Research Question: Is perceived environmental uncertainty a moderator of the relationship between strength and weakness indicators and firm effectiveness, as perceived by managers?

The hypotheses and research question are important, for several reasons. For example, if perceptions do vary, questions of "true," "best," "appropriate" or "weighted" (what weighting?) perceptions become important. How should researchers measure PEU? How should a planning process be designed to account for differences in perceptions? How can perceptual variance be reduced, or should it? Confirmation of the hypotheses suggests that these questions and others become significant issues for future research. The view that only top management perceptions are important in strategy formulation processes is naive. Research conducted by Bower (1970), Prahalad (1976) and Burgelman (1983), among others, has established that the entire strategy formulation process is diffuse and involves several management levels.

### Method

#### Sample

Data were collected from top, middle, and appropriate lower-level managers from three firms among the largest 500 companies in South America. Two firms were headquartered in Venezuela, one in Brazil. Three different industries (oil tools, petrochemical and brewing) were represented. The sample included 56 managers: 12 top managers; 24 middle managers; and 20 lower-level managers (only lower-level managers with input into and/or involvement with the strategic planning process were included). Of these 56 managers, 31 were from the oil tools firm (7 top, 6 middle, 18 lower), 21 from the brewing firm (4 top, 15 middle, 2 lower), and four from the petrochemical firm (1 top, 3 middle). The differential, relative proportions from each firm reflect the approach used



in the strategic planning process and firm structures. For example, all management levels are highly involved in strategic planning in the oil tools firm. However, the strategic planning process in the petrochemical firm is more centralized with involvement of only key management staff.

Many of the managers sampled were educated in the U.S. and most had attended management development seminars on strategic planning processes. Each of the firms uses a "normative" strategic planning process. Thus, although some cultural differences may exist, this group of managers and firms provides a representative sample of how managers apply the normative strategy formulation process.

#### Data Collection Procedure

Analysis of internal factors (strength and weakness indicators) used by managers in determining strategic actions required a procedure to define the factors utilized accurately. Stevenson (1976) conducted personal interviews. However, as noted previously, evidence exists suggesting that managers' descriptions of factors used in making decisions may be inaccurate (Hoffman, 1960; Slovic, 1969; Balke, Hammond & Meyer, 1973). Similarly, Hambrick (1982) suggested that managers may be unable to describe their actual, environmental scanning behaviors accurately. Argyris and Schon (1974) argue that, in these instances, a procedure must be used to capture "theories in use" rather than "espoused theories."

The policy-capturing procedure (Slovic and Lichtenstein, 1971; Slovic, Fischhoff and Lichtenstein, 1977) used to obtain a major part of the data (decision factors used in determining strategic actions) satisfies the concern raised by Argyris and Schon (1974). Policy capturing has been used successfully



in similar instances (e.g., Hitt & Middlemist, 1979; Hitt, Ireland, Keats & Vianna, 1983). Use of this procedure requires that a comprehensive list of decision factors (strength and weakness indicators, in this instance) be identified. A panel of four Latin American managers, each with extensive experience in strategic management, was used to develop a list of possible decision factors. Stevenson's (1976) compilation served as a foundation. Based on the panel members' experiences and knowledge sets, some factors were added while others were deleted. The final list included 21 factors (as shown in Table 1) that may be important indicators of a firm's health (based on internal evaluations).

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Insert Table 1 about here  
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The policy capturing procedure specifies that managerial decisions be observed so that models of the factors used in the decisions and their respective importance weightings can be developed. Doing this requires that descriptions of multiple simulated firms be developed in terms of the indicators of firm health (decision factors) varying the levels of these indicators. Once developed, managers are asked to assume that the simulated firm's objectives, products and technologies are similar to those of their own firm. Each simulated firm is then to be examined and its effectiveness evaluated. Treating the effectiveness ratings as dependent variables and the 21 indicators (with levels varying between each case) as independent variables, regression models can be constructed denoting the decision factors used in the managers' effectiveness evaluations and their weightings.

Thirty simulated cases were developed in which the levels of the independent

variables were randomly varied on a scale of one (poor), two (bad), three (average), four (good), five (excellent). The random assignment of levels of the independent variables was designed to control for researcher bias and potential collinearity. This procedure is described fully in Hitt and Middlemist (1979) and Hitt et al. (1983). A sample case is shown in Table 2.

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 Insert Table 2 about here  
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The number of cases was limited to 30 for reasons of response practicality. Managers were given the thirty cases and were instructed to rate the effectiveness of each firm on a scale of one (very ineffective) to seven (very effective). They were asked to rate the effectiveness of each firm based on the indicator levels presented in each case. The managers were told that the indicator levels were determined by a managerial audit. Previous research suggests that managers search for the indicators most important to their own strategic actions, observe the indicator levels presented in the case, and decide on the simulated firm's effectiveness (Hitt and Middlemist, 1979).

Each manager completed an effectiveness rating for 30 simulated firms, yielding a sample size of 30 x 56 or 1680 observations. This procedure is almost identical to a repeated measures design. Precedent exists for the assumption that each case represents an independent observation (Stewart & Gelberd, 1972; Hitt & Middlemist, 1979; Hitt et al., 1983).

#### Indicator Independence

The random assignment of indicator levels should disallow collinearity among the independent variables, thereby avoiding the effect found by Dudycha and Naylor (1966) [that interrelationships among decision cues (indicators in this

research) affected raters' judgments]. An intercorrelation matrix was constructed to examine the independence among the indicators. The matrix shows the bivariate Pearson product-moment correlations for each pairing of 21 indicators over the 30 cases ( $n = 30$ ).

As shown in Table 3, the highest  $r$  between any pair of indicators was .49 yielding a highest common variance of .24. Furthermore, 98 percent of the pairwise  $r$ 's were below .4 and 87 percent were below .3. The lack of collinearity lends more credence to the decision models derived.

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Insert Table 3 about here

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#### Perceived Environmental Uncertainty

A second data set acquired through the managers' responses concerned perceived environmental uncertainty. The Miles and Snow (1978) PEU instrument, modified for the Latin American environment, was used to collect these data. As used in this research, the instrument contained six scales, composed of 25 items, that measured perceived uncertainty in six major dimensions of a firm's external environment: (1) suppliers of raw materials and parts; (2) competitors' behavior; (3) clients; (4) financial/capital markets; (5) government regulatory agency actions; and (6) behavior of labor unions.

Managers were asked to evaluate the predictability of each item of the environment on a seven-point Likert-type scale. Means from each of the six scales were obtained and summed for the total PEU scale. To assess instrument reliability, coefficient alphas were calculated for each scale. All coefficient alphas were acceptable except for the "clients" scale. However, elimination of one item resulted in an acceptable coefficient for the scale. The six coef-

ficient alphas were: suppliers of raw materials and parts (.69); competitors' behavior (.66); clients (.60); financial/capital markets (.75); government regulatory agency actions (.89); and behavior of labor unions (.78).

### Results

Individual decision models were examined first to insure the effort and consistency of each subject manager. Hitt and Middlemist (1979) and Hitt et al. (1983) used the heuristic of  $R^2 > .40$  for inclusion of individual models in further analyses. Hitt and Middlemist (1979) conducted post hoc analyses that supported the appropriateness of this heuristic. This heuristic was also used in this study. Stepwise linear regression analysis, with the effectiveness ratings as the dependent variable and indicator values as the independent variables, was used to develop individual decision models. Slovic et al. (1977) concluded that the linear model does a remarkably good job of predicting human judgments. The criterion for inclusion of indicator variables in the model was  $p < .05$ .

Only one individual manager's model ( $R^2 = .134$ ) failed to satisfy the heuristic. All other individual manager's models had  $R^2$ 's greater than .40. The highest individual model  $R^2$  was .955. Excluding the one data set with an  $R^2 < .40$  resulted in a sample size of 55 managers and 1650 observations.

The next step in the analysis was to develop a regression model (in stepwise fashion) for the combined sample of 55 managers and 1650 observations. The results of the analysis are shown in Table 4. There were 12 statistically significant indicator variables and the model had an  $R^2 = .375$ . The strongest predictor in the combined model was "the planning system." An  $R^2 = .375$  with individual model  $R^2$ 's greater than .40 indicates only moderate agreement among

the managers. Differences may exist by management level and/or environmental uncertainty.

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 Insert Table 4 about here  
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### Management Level

Regression models were developed to examine the important strength and weakness indicators for each management level. Results of these analyses are shown in Table 5. The regression models for top managers and for lower-level managers show some improvement (gains in  $R^2$ ) over the aggregate managerial model. However, there seems to be less consistency among middle managers. Comparing the models across management levels suggests some differences (e.g., the organizational form and structure indicator appears only in the lower-level management model while the distribution channels indicator appears only in the top management model). Weights of the indicators also varied between models; however, the differences were not large. Therefore, further analyses were necessary. Regression models were developed for each management level within each firm. Results of these analyses are shown in Tables 6, 7, and 8. In these models differences by level become more distinct. There were four of fourteen indicators used that were common in all managerial models in the oil tools firm. Only one indicator out of eleven used was common to all models in the brewery. No common indicators among the two managerial models in the petrochemical firm were found. Weights and signs of some of the common indicators (in two or three models) also varied across managerial models within firms. The model  $R^2$ 's were higher in most cases for the top management and lower-level managers within firms. Middle-level manager models were the least consistent. In total, results from these analyses support hypothesis 1.

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 Insert Tables 5, 6, 7, and 8 about here  
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### Perceived Environmental Uncertainty

Based on previous use of the construct and research evidence cited previously, environmental uncertainty, as perceived by managers, may be expected to vary by firm, since the firms were in different industries and one was located in a country different from the other two firms. Mean PEU scores for managers from each firm were: oil tools ( $\bar{X} = 21.22$ ); brewery ( $\bar{X} = 18.15$ ); and petrochemical ( $\bar{X} = 21.63$ ) ( $F = 4.10$ ,  $p < .05$ ). The ANOVA shows statistically significant variance among the mean PEU scores. However, Duncan's multiple range test, used to examine where those differences occurred, failed to show significant differences by firm. The only element in the environment where differences were detectable regarded the "clients" dimension. The brewery managers had statistically significant lower perceived uncertainty with clients ( $\bar{X} = 2.33$ ) than either oil tools managers ( $\bar{X} = 4.33$ ) or petrochemical managers ( $\bar{X} = 4.05$ ) ( $F = 20.91$ ,  $p < .01$ ).

Although few differences in PEU were found by firm, differences in PEU by management level were detected in the ANOVA. The mean PEU scores by management level were: lower-level managers ( $\bar{X} = 22.19$ ); middle managers ( $\bar{X} = 18.48$ ); and top managers ( $\bar{X} = 20.15$ ) ( $F = 4.96$ ,  $p < .02$ ).

Major differences existed by management level in the perceived uncertainty of "clients" ( $F = 7.01$ ,  $p < .02$ ), "financial markets" ( $F = 2.86$ ,  $p < .07$ ) and "labor unions" ( $F = 2.90$ ,  $p < .07$ ). Results of Duncan's multiple range test appear in Table 9. As shown, lower-level managers perceived more general environmental uncertainty than middle-level managers, but not as compared to

top-level managers. Lower-level managers perceived more environmental uncertainty in the "clients" dimension than top or middle managers. Lower-level managers perceived more uncertainty in the financial markets than middle managers. Finally, top managers perceived more environmental uncertainty with labor unions than middle managers. These results support hypothesis 2.

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Insert Table 9 about here

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Given the results suggesting that perceptions of both strength and weakness indicators and PEU vary by management level, it was important to determine if PEU influences the strength and weakness indicators seen as important by managers. Therefore, analyses were designed to test if PEU moderated the relationship between strength and weakness indicators (independent variables) and managerial ratings of firm effectiveness (dependent variable).

Moderated regression analysis was used to test the moderating effect of PEU. This analysis yields a conservative estimate of the moderating effects one variable has on the relationship between two or more other variables (Darrow & Kahl, 1983). The dependent variable is regressed on a set of predictor variables, a hypothesized moderator variable and a cross product of the preceding terms ( $y = a + bx + cz + dxz$ ), where  $y$  is the dependent variable,  $x$  is the independent variable,  $z$  is a hypothesized moderator variable and  $xz$  is the interaction term (Bedeian, Mossholder, & Armenakis, 1983). The purpose is to determine if the addition of the interaction term increases the explanation of the variance ( $R^2$ ) in the dependent variable significantly.

Results of the moderated regression analysis are shown in Table 10. The difference in  $R^2$  between the restricted ( $y = a + bx + cz$ ) and full ( $y = a + bx + cz + dxz$ ) models was tested using the procedure recommended by Cohen (1968). As



shown, the difference in  $R^2$  was statistically significant. However, the difference in  $R^2$  was small (1.3 percent). Stone (1976) noted that moderating effects of approximately one percent are negligible. Therefore, PEU's moderating effect may be considered insignificant. As a result, additional analyses were unnecessary.

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Insert Table 10 about here  
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## DISCUSSION

The normative view of strategy formulation processes has been examined extensively.<sup>2</sup> Horovitz (1984) concluded that much more is known about these processes than those associated with strategy implementation.

Although popular, the validity of the normative view has been questioned. Mintzberg (1973; 1978), Bower and Doz (1979), Bourgeois (1980), and Quinn (1980) are among those suggesting deficiencies in the normative view. More recently, Venkatraman and Camillus (1984) summarized many of these concerns.

The research study reported herein focused on one component included in the normative approach to the formulation of strategies. While some debate might surface, most would agree that the identification of a firm's internal strengths and its weakness is critical in the formulation of a strategy. Some (e.g., Higgins, 1983) suggest that it is the first activity that should be completed and others (e.g., Hitt and Ireland, in press) argue that strengths and

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<sup>2</sup>In a recent work, Venkatraman and Camillus (1984) discussed the contributions key studies have made to what they labeled the "Strategy Formulation School."



weaknesses must be identified at both the corporate and business unit levels in the multibusiness firm. The position adopted herein is that lack of full knowledge regarding appropriate application of the normative formulation process, and not the process itself, may account for concerns raised by Mintzberg (1973; 1978) and others. More directly, this research was conducted to examine the possibility that the strengths and weaknesses identified by managers at different levels within given firms are influenced by individuals cognitive schemas, biases and the information available to them. Similarly, these individualized-characteristics may affect the environmental uncertainty perceived by managers operating at different levels within an organization.

Results of this research suggest that the normative approach to the formulation of strategies may not be an appropriate descriptive model. With additional knowledge, firms may be able to execute superior strategy formulation processes. While the same reasoning possibly could apply to other parts of the normative strategy formulation process, this research focused only on attempts to identify a firm's internal strengths and weaknesses.

#### Variance of strengths and weaknesses' indicators by managerial level

The first hypothesis suggested that perceptions of strengths and weaknesses' indicators would be different among three managerial levels. Viewed jointly, the results support this hypothesis.

The overall regression model showed only moderate agreement among managers. The regression models for each of the management levels showed some agreement as well as differences. Six indicators (the interest and abilities demonstrated by top management, the planning system, the abilities of employees, knowledge of client's needs, services provided to clients and information on market share) were common in each of the regression models for top, middle and lower level

managers (although the indicator weightings varied among the models). The importance of these six indicators should perhaps be expected. As a whole, they reflect the firm's needs to evaluate external conditions, the necessity of understanding the needs expressed by the firm's clients and the role a planning system and top level managers' skills and commitments play in a firm's performance.

With respect to other indicators, differences were found. For example, product quality and the price-earnings index were shown to be important indicators for top and lower level managers, but not for middle level managers. It is not surprising that product quality was selected as a critical indicator. Those at the top level must justify the quality of their firm's product to external constituencies. In the United States, for example, we have seen Lee Iacocca appear on national television and challenge consumers to buy an automobile superior in quality to the Chrysler product, if one can be located. Similarly, the Ford Motor Company now suggests that "quality is job #1" in its firm. For lower level managers, product quality is necessary since the technical core (the area for which these individuals are responsible) often is buffered (Thompson, 1967) to assure successful operations. In a similar manner, the importance of the price-earnings index as a strength and weakness indicator for a top level manager is understandable. However, this indicator was weighted more heavily by the lower level managers. This finding simply may reflect an appreciation for the importance of an often-used financial performance measure and the influence the index may have on a firm's future. The fact that neither one of these indicators were found to be important by middle level managers is interesting. This finding may be a product of the primary responsibility assigned to middle level managers. These individuals typically must voice con-

cerns of those below them to top level managers while simultaneously assuring that top level managers' desired strategies and actions are implemented by those operating in the firm's technical core. Perhaps this "coordinating/integrating" responsibility results in less attention being paid to the firm's actual output (i.e., the quality of the product produced) and external judgements (e.g., the price-earnings index) of the firm's performance. Thus, the lower agreement among middle managers regarding importance indicators may reflect the variability in their jobs and responsibilities.

Another example of differences among managerial levels is the lower level managers' selection of two indicators (organizational form and structure and employee activities) not chosen by other managers. This suggests that the manner in which work roles are segmented and then recombined, along with the distribution of power across these roles (Galbraith and Nathanson, 1978) affects lower level managers significantly. Clearly, their subordinates respond to structural configurations. Apparently then, those who select structural forms (top level managers) and those who assure their implementation (middle level managers) believe they are less important strength or weakness indicators for a firm.

Differences among managerial levels within each firm were also examined. These results suggested greater variances by managerial level in the perception of a firm's strengths and weaknesses indicators. In the oil tools firm, for example, only four indicators (the interest and abilities demonstrated by top management, the planning system, knowledge of client's needs and information on market share) were selected by managers at all three levels. In total, fourteen indicators appeared in these managers' models. Of greater interest is the fact that four other indicators were chosen only by lower level managers, while three

others were included only in middle level managers' models.

The diversity is even more pronounced among subjects in the brewery and the petrochemical firms. Only one indicator (the planning system) appeared in all three managerial levels' models in the brewery firm. Three indicators were common to top and middle level managers. Interestingly, top managers included three indicators in their models that were not selected by the remaining two sets of managers while three other indicators were chosen by middle managers alone. Finally, no common indicators emerged between the two managerial levels (top and middle) in the petrochemical company.

In total, the results suggest that perceptions of strengths and weaknesses indicators can be expected to vary among three managerial levels. As noted previously, perceptions of internal strengths and weaknesses are a critical input to a firm's strategy formulation process. The fact that indicators used to identify strengths and weaknesses may not be consistent among managers is significant. A firm's strengths represent those capabilities that can become distinctive competencies--that is, what the firm can do better relative to its competitors. Hofer and Schendel (1978) suggest that distinctive competencies must be exploited to gain a competitive advantage.

Once identified, a firm's strength must be nurtured for it to become a distinctive competence. This is accomplished through a concentration of organizational resources (Kiechel, 1982; Yavitz and Newman, 1982; Hitt and Ireland, 1984). Such an emphasis would be virtually impossible, however, if managers at different levels in a firm do not agree on the indicators that reflect the firm's strengths and weaknesses. Efforts to form distinctive competencies consistent with each managerial level's perception of the world would result in misallocations of resources (and in turn, would impact negatively on financial

performance). Thus, these results suggest that managers' schemas and biases may affect the formation of distinctive competencies.

#### Variances in perceptions of environmental uncertainty among managerial levels

Research evidence suggests that perceptions of the degree of uncertainty in a firm's environment affect a firm's actions (Emery and Trist, 1965; Lawrence and Lorsch, 1967). Among the actions affected are those involved with strategic planning processes (Lindsay and Rue, 1980; Boulton et al., 1982), a firm's strategic norms (Dirsmith and Covalesski, 1983) and patterns of influence that form within an organization (Hrebiniak and Snow, 1980). Given this evidence, coupled with the nature of this study's sample, it was expected that perceptions of environmental uncertainty would vary among managers in different firms. Further, evidence that uncertainty perceptions differ by administrative hierarchical level (Cox et al., 1978) and indications that our perceptions of today's environmental conditions are often thought to be highly consistent with conditions identified in previous work experiences (Kielser and Sproul, 1982) suggested that these perceptions would be different among top, middle and lower level managers.

Managers in the three firms studied reflected a significant difference in the perception of only one dimension (clients) of environmental uncertainty. This finding may suggest similarities in the external environmental conditions faced by the three firms or that the differences are more systematic across management levels than across firms.

The results showed differences in perceptions of environmental uncertainty among individuals in different managerial levels, providing support for the second hypothesis. This suggests that managers' cognitive schemas do affect one's perceptions of how much uncertainty is in the firm's environment. Overall, lower level managers perceived significantly greater amounts of uncer-

tainty as compared to those at the middle level, but not as compared to top level managers. Thus, the heuristics used by lower level managers, and the kinds of information available to them, may influence perceptions of environmental uncertainty differently than those of middle level managers.

This finding is also of interest in light of Thompson's (1967) work. Thompson suggested that organizations attempt to seal off, or buffer their technical cores from environmental disturbances. This is intended to increase efficiency. These results may reflect a failure to buffer the cores in the three firms studied. The moderating effect of PEU on the perceptions of important strengths and weakness indicators was minimal and was thus considered to be of little consequence.

The practical implications of these results are obvious. Those involved in strategy formulation processes should recognize the possibility that managers' cognitive schemas may affect their perceptions of uncertainty in external environments. Once recognized, efforts could be initiated to determine cognitive elements contributing to the schemas and actions that are appropriate to deal with these realities.

### CONCLUSIONS

The normative model of strategy formulation holds that the process starts with the assessment of a firm's internal strengths and weaknesses and its external opportunities and threats. While other perspectives exist, the normative model has undoubtedly been the most popular.

The present study examined the actual assessment of strengths and weaknesses and environmental uncertainty by individual managers at various levels in an organization. First, the researchers established, on the basis of recent research in cognitive psychology and results from organizational theory, that



there are reasons to expect assessments of both the firm and its environment to vary systematically as a function of organizational level. Second, these expectations were formalized as hypotheses and were tested in a sample of three firms using managers with input to or involvement in the strategic planning process. A "policy capturing" approach to these tests was used to circumvent the problems associated with "espoused theories" as opposed to "theories in use". The statistical tests confirmed that perceptions of strengths and weaknesses and environmental uncertainty do vary systematically as a function of organizational level.

These results have far reaching consequences for both research and practice in strategic management. From a practical point of view two issues are of immediate concern. First, should the normative model be discarded in favor of an alternative (what alternative?), given the ambiguous nature of assessments of the firm and its environment? Second, what is meant by "strengths and weaknesses" and "opportunities and threats"? Operationally, these terms are partially dependent on the level of management doing the assessment. The assessment cannot be divorced from the assessor. This issue cuts directly to the design of strategic planning systems and processes. Should systems be designed to focus on the union or the intersection or some other set of assessments? Can assessments be weighted and combined? How much and what kind of input should be sought from the various levels of managers? Questions such as these, largely absent in the normative model, become highly salient in light of the current research.

From a research perspective the current paper raises several interesting issues. Among these are the fact that these results call into question the use of questionnaire approaches when conducting strategy research, wherein typically

a single manager is asked to respond to questions about a firm, its strategy, its planning process, or its environment. Such studies obviously run a substantial risk of measuring the perceptions of a sample of individuals rather than the characteristics under study. But then one is still left with the philosophical issue of the "true" response, given the difficulty of separating the assessment from the assessor.

An interesting research issue is the partition of the variance in perceptions of a particular variable such as strengths. For example, how much of it is due to industry effects, firm effects, managerial level, functional specialty, and individual differences? In this context, the current work is merely a specialized study that raises the more general issue.

Overall the research reported herein suggests that much more investigation is needed in the general area of perception and cognition. How do managers involved in strategy formulation processes perceive and conceptualize important issues? What are the relationships between perceptions, conception and reality? How do schemas vary across firms and across managerial levels in a particular firm? Can "objective" approaches to strategic management, independent of the particular manager, be developed? These and related questions raise vital issues that are as yet only modestly understood and in need of substantial study.



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Table I  
Strength and Weakness Indicators

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I 1	The organizational form and structure
I 2	The interest and abilities demonstrated by top management
I 3	The standard operating procedures
I 4	The control system
I 5	The planning system
I 6	Employee activities
I 7	The technical abilities of employees
I 8	The number of employees
I 9	The abilities of employees
I10	Knowledge of clients' needs
I11	Product quality
I12	Services provided to clients
I13	The industrial plant (size, energy, equipment, etc.)
I14	Production techniques
I15	Product development
I16	Financing capacity
I17	The price-earnings index
I18	Growth tendencies
I19	Distribution channels
I20	Relations with labor unions
I21	Information on market share

## Sample Case With Instructions

The purpose of this section is to obtain your rating of the effectiveness of 30 hypothetical firms. Different information will be presented to you which will help you in the determination of the effectiveness of each firm. It is expected that an "effective" firm is considerably different than an "ineffective" firm according to the terms of the presented information. A good distribution of effective, partially effective, and ineffective firms are included.

The resulting data is presented in the form of a five point scale (from poor to excellent) as ranked by the auditors. Please, read each one of the audit reports, consider the information given for that particular firm and evaluate its effectiveness on the seven point scale located at the end of the report. There are 30 firms; therefore, measure your time, consider the information before noting your judgment and utilize the most adequate point in the scale.

very ineffective       $\frac{X}{1} : \frac{2}{2} : \frac{3}{3} : \frac{4}{4} : \frac{5}{5} : \frac{6}{6} : \frac{7}{7}$       very effective

very ineffective     $\bar{1}$  :  $\bar{2}$  :  $\bar{3}$  :  $\bar{4}$  :  $\bar{5}$  :  $\bar{6}$  :  $\bar{X}$  :  $\bar{7}$     very effective

### General Information About the Simulated Firms:

In order to assist in the evaluation of the simulated firms the following must be assumed:



Table 2 Continued

- 1) Each firm has essentially identical managerial objectives, clients, external environment, etc.
- 2) Since the audit reports contain data about how well the firm performs various activities (but not which activities in particular), assume that each firm performs activities very similar to those of your firm.
- 3) Remember that the information given in the audit report is in the form of poor, regular, etc.

Firm #1

	Audit Report				
	Poor 1	Bad 2	Average 3	Good 4	Excellent 5
1. The organizational form and structure	—	<u>X</u>	—	—	—
2. The interest and abilities demonstrated by top management	—	—	—	<u>X</u>	—
3. The standard operating procedures	<u>X</u>	—	—	—	—
4. The control system	—	—	<u>X</u>	—	—
5. The planning system	—	<u>X</u>	—	—	—
6. Employee activities	—	—	—	—	<u>X</u>
7. The technical abilities of employees	—	—	—	<u>X</u>	—
8. The number of employees	—	—	—	—	<u>X</u>
9. The abilities of sales personnel	—	—	<u>X</u>	—	—
10. Knowledge of clients' needs	—	—	<u>X</u>	—	—
11. Product quality	—	<u>X</u>	—	—	—



Table 2 Continued

	Audit Report				
	Poor 1	Bad 2	Average 3	Good 4	Excellent 5
12. Services provided to clients	—	<u>X</u>	—	—	—
13. The industrial plant (size, energy, equipment, etc.)	—	—	—	—	<u>X</u>
14. Production techniques	<u>X</u>	—	—	—	—
15. Product development	<u>X</u>	—	—	—	—
16. Financing capacity	—	—	<u>X</u>	—	—
17. The price-earnings index	—	—	—	<u>X</u>	—
18. Growth tendencies	—	<u>X</u>	—	—	—
19. Distribution channels	—	—	<u>X</u>	—	—
20. Relations with labor unions	—	<u>X</u>	—	—	—
21. The information about market share	—	—	—	—	<u>X</u>

Please rate the effectiveness of this firm on the following scale by placing an X above the appropriate number.

Very ineffective    1 : 2 : 3 : 4 : 5 : 6 : 7    Very effective

### Intercorrelation Matrix for Strength and Weakness Indicators

[illegible]

Table 4

Regression Model of Significant Indicators For  
Internal Assessment-Overall Sample

Strength & Weakness Indicators	$\beta$	F
I5	.35	160.69**
I12	.20	50.69**
I17	.19	20.60**
I2	.18	44.32**
I9	.16	43.26**
I21	.14	21.06**
I10	.14	37.35**
I1	.10	9.96**
I15	.09	9.60**
I11	.08	10.06**
I18	.07	5.07*
I7	-.06	4.38*
<hr/>		
$F = 75.20^{**}$		
$d.f. = 13,1636$		
$R^2 = 0.375$		
<hr/>		

\*p < 0.05

\*\*p < 0.01

Table 5

Regression Models of Strength and Weakness  
Indicators for Each of the Three Management  
Levels

Strength & Weakness Indicators	Top Management SRC	Middle Management SRC	Lower-Level Management SRC
I1			.13**
I2	.14**	.18*	.08*
I3			
I4			
I5	.30**	.46**	.39**
I6			.09*
I7	-.16**	-.17**	
I8			
I9	.13**	.08*	.21**
I10	.21**	.13**	.16**
I11	.13*		.19**
I12	.19**	.14*	.29**
I13			
I14			
I15			
I16			
I17	.17*		.24**
I18			
I19	.15*		
I20			
I21	.18**	.24**	.14**
	F = 23.26** d.f. = 11,348 R <sup>2</sup> = .43	F = 47.78** d.f. = 7,712 R <sup>2</sup> = .32	F = 45.54** d.f. = 10,559 R <sup>2</sup> = .45

\*p < .05

\*\*p < .01

SRC: Standardized Regression Coefficient

Table 10

Moderated Regression Analysis with  
Perceived Environmental Uncertainty as the Moderator

Model	R <sup>2</sup>	$\Delta R^2$	F
Restricted	.383		
		.013	1.892** (42,1607)
Full	.396		

\*\*p < .01

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